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INDICATIONS FOR OPERATIVE INTERFERENCE IN MIDDLE EAR SUPPURATION*

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SUPPURATIVE disease of the middle ear is so common, especially among children, that we are prone to forget the serious possibilities inherent in every discharging ear. Reliable statistics gathered by Koerner, substantiated by Bezold, showed that four-tenths of one per cent of all deaths occurring under the age of thirty in Prussia were due to ear diseases. Statistics for our own country, were they available, would disclose even a higher death rate.

With a better knowledge of the anatomy and pathology of the temporal bone, improved methods of diagnosis and surgical technic, and, above all, with a clearer understanding of the indications for operative interference, now well defined, the modern otologist when he encounters a fatal case of suppurative otogenous disease is reluctantly obliged to pronounce to himself the sad and silent verdict: "This patient should have lived." In other words, under modern care deaths from the complications of middle ear inflammation are largely preventable.

This presentation has been stimulated chiefly by a recent study of the cases coming to operation in the ear clinic of the University Hospital during the past three years. Time does not permit case reports nor any statistical analysis. For our present purpose it is sufficient to state, without any criticism or apology, and in spite of many notable recoveries when complications were present, that the mortality has been unfortunately too high. A very extenuating circumstance is found in the fact that often the general practitioner and pediatrist who attended these patients first were not themselves consulted until complications had already occurred. Many of these patients were admitted in a critical condition.

The first object of operative interference in a case of middle ear suppuration is to save life by removing the possibility of a serious complication; the second object is to conserve the hearing.

One of the most perplexing questions confronting the physician since the beginnings of otology has been, "What are the definite indications for operation?" In the following paragraphs we shall attempt to briefly summarize what is the best otologic opinion on this very important subject. There is not time to refer to individual authors.

The first fundamental principle in dealing with middle ear inflammation is that with every severe infection of the middle ear there occurs more or less involvement of the adjacent structures, *i.e.*, the antrum and neighboring mastoid cells or bone. A second recognized fact is that the symptoms, course, outcome and indications for operative interference in any case of purulent otitis media are largely determined by three factors: (1) the type and virulence of the invading organism; (2) the resistance of the patient; (3) the anatomical structure of the invaded temporal bone.

1. Under the first head it should be recalled that there is great variation in the virulence of the invading germ at different seasons and in different epidemics. Of the different organisms producing otitis media, the streptococcus hemolyticus and the streptococcus mucosus are the ones most prone to cause complications, the former through early involvement of the blood stream, the latter, because of its characteristic to insidiously and progressively destroy the bony

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the radical mastoid operation in chronic suppurative cases are as follows:

1. Failure to secure a dry ear by the usual conservative treatment. This is the most important and the one most frequently ignored.
2. Evidence of labyrinthine involvement.
3. Evidence of the development of brain abscess, meningitis or pyemia.
4. The formation of a subperiosteal abscess.
5. The appearance of facial paralysis.

We most frequently fail in our duty to the patient with a chronic suppurative otitis media. As a rule, he has not been sufficiently impressed with the importance of securing a dry ear. Failure to attain this condition by adequate treatment indicates that the bone is diseased in its deeper parts, the affected regions being often surrounded by sclerosed areas. How serious the condition may be even the roentgenogram does not reveal. Cholesteatoma frequently erodes extensive areas exposing them to the possible invasion of a virulent organism which may enter through the upper respiratory tract or through the blood stream. No one can tell when, under conditions of lowered resistance, a spectacular and alarming flare-up may occur. He who advises a patient to disregard a persistent discharge from the ear as a mere trifle, to be ignored until definite symptoms indicating the need of operation appear, is inviting disaster to his patient and criticism for himself. The mortality from such cases where operation becomes necessary after the occurrence of a complication is extremely high, whereas it is practically nil where operation is properly performed before complications set in.

Conclusions

1. Operations for the cure of suppurative diseases of the middle ear, whether acute or chronic, should be performed promptly and fearlessly as soon as surgical intervention is definitely indicated, if we would materially reduce the deplorably high death rate from these common ear diseases.

2. It is far safer to err in the direction of operating too early rather than too late.

3. The responsibility for the recognition and adequate care of cases of suppurative otitis media needing surgical attention rests more heavily on the general practitioner and the pediatrist who see them first than upon the otologist, who frequently is not called in consultation until after serious complications have arisen.

THE RELIEF OF ACUTE ASTHMA BY THE INTRAVENOUS ADMINISTRATION OF CONCENTRATED GLUCOSE SOLUTION*

Report Of Cases

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HYPERTONIC glucose solutions have been administered intravenously in uremia, myocardial insufficiency, infectious disease, bichloride poisoning, tetanus, ocular disorders, skin lesions, nervous disturbances, and edema of the lungs. In severe and prolonged bronchial asthma it was assumed that the patient suffered also from a secondary pulmonary edema, and that, if the edema was relieved, the patient's asthma would be improved. On the above assumption and observation, a 50 per cent glucose solution was selected for intravenous administration. Such a solution placed in the vascular system would withdraw fluids from the tissues and act also as an excellent diuretic.

Report of Cases

Case 1.—Chronic bronchitis, bronchiectasis, bronchial asthma, cholelithiases.

The patient was forty-eight years old, married and had eight children. The past history was negative except for a tonsillectomy. The present trouble began five years ago with an upper respiratory infection, leading to a chronic bronchitis and occasional asthmatic attacks. The asthmatic attacks gradually became more frequent and longer in duration. In the morning the patient

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ould have prolonged coughing spells, and then raised great deal of sputum. Various drugs, vaccines, and nhalations had been tried with very little relief. On dmission to the hospital she was receiving in twenty- our hours, two hypodermics of adrenalin chloride, m. each, 1/6 gr. hypodermic of morphia, and two apsules of ephedrin-amytal compound. The physical xamination was negative except for typical findings f a chronic bronchitis, bronchiectasis, bronchial asthma, nd a symptomless cholelithiasis.

The patient was admitted to the hospital on April 24, 933. On April 26 she received intravenously 15 c.c. f a 50 per cent glucose solution. No particular change as noted. On April 27, she received 20 c.c. of a 0 per cent glucose solution. The next day she said he breathing was easier. On April 28, she received 0 c.c. of a 50 per cent glucose solution. The asthma isappeared. No further adrenalin, ephedrin, or opiates ere necessary. The cough was embarrassing and con- iderable sputum was being raised daily. Since there ere no further attacks for a week the patient was ischarged from the hospital and advised to take mild edatives for controlling the cough.

She appeared at the office on October 2, 1933, stating hat she felt quite well except for the cough, and free rom asthma until about a week ago. She had again ypical findings of a bronchial asthma. On October 2, 5 c.c. of a 50 per cent glucose solution was given ntravenously, and on the third, fifth, and sixth, 50 c.c. f a 50 per cent glucose solution was given at the office. She was again very much improved.

Comment: Although the treatment was not remark- ble it was nevertheless encouraging. After the first eries of glucose administrations the patient was free rom asthma for nearly five months. The second group f glucose injections also relieved the asthma.

Case 2.—Chronic bronchitis, bronchial asthma.

The patient was forty-two years old, a female, and narried, with a negative past history except for bron- hial asthma for one year, twenty years ago, and a nervous breakdown" in 1931.

In the spring of 1933 following an upper respiratory nfection she developed a chronic bronchitis with noc- urnal attacks of bronchial asthma. On June 14, 1933, he entered St. Joseph's Hospital and was given six ypodermics of adrenalin chloride, 8 m. each, and two ypodermics of pantopon, gr. ⅓, for the relief of the sthma in the first twenty-four hours. The physical xamination was negative except for typical findings f a chronic bronchitis with bronchial asthma. The aboratory findings were also negative except for an osinophilia of 9 per cent.

June 15, she was given 80 c.c. of a 50 per cent glucose olution intravenously. Following this administration nly two hypodermics of adrenalin in twenty-four hours ere necessary to control the asthma. On June 16, she as given 100 c.c. of a 50 per cent glucose solution ntravenously. The asthma disappeared, no further glu- ose was given, and she was discharged from the hos- ital August 2, 1933.

On July 31, 1933, she was readmitted to the hospital gain stating that she had been free of asthma for one month and then it recurred. On July 31, and August 1, she was given 100 c.c. of a 50 per cent glucose solution intravenously. The asthma disappeared and she was discharged from the hospital August 2, 1933.

Comment: The results in this case were almost dramatic. Two injections relieved the asthma, and when it recurred one month later, two injections again were sufficient to control the attacks. The patient still has chronic bronchitis, and may again have asthmatic attacks.

Case 3.—Chronic bronchitis, bronchial asthma.

The patient was married, thirty-five years old, and had a negative past history except for frequent "colds." The present onset of asthma began nine years ago following an upper respiratory infection. The general physical examination showed septic tonsils, typical findings of bronchial asthma, left inguinal hernia, and a 5 per cent eosinophilia.

He was admitted to the hospital on July 27, 1933, and 100 c.c. of a 50 per cent glucose solution was given intravenously. The asthma disappeared, the tonsils were removed, and a few days later he was discharged from the hospital. On October 12, 1933, in response to a letter he appeared at the office, and said that he had had no asthmatic attacks but on examination there was some wheezing in the chest. He was given 50 c.c. of a 50 per cent solution of glucose on October 12 and 19, for the determination of its effect on this type of breathing. The breathing was definitely improved.

Comment: The patient's attacks varied a great deal in duration, and although he thought that the treatment was most efficient, one should cautiously draw conclusions from a single injection. The effect on the asthmatic bronchitis was said to be favorable.

Case 4.—Chronic bronchitis, bronchial asthma.

The patient was forty-three years old, married, and the past history showed frequent colds, operated sinuses, and a tonsillectomy. The asthmatic attacks began six years ago. She had been treated by autogenous vaccines, adrenalin chloride, ephedrin, various medicated inhalations, opiates, and hypodermics of morphia. There were typical findings of an asthmatic bronchitis with an eosinophilia of 14 per cent.

When the patient was examined she was suffering only with an asthmatic bronchitis. On September 12 and October 3, 1933, she was given 50 c.c. of a 50 per cent glucose solution intravenously to observe its effect on the asthmatic bronchitis. The breathing was improved.

Comment: The patient stated she breathed much easier after receiving the injections, and the last examination of the chest revealed no whistling sounds. Since asthmatic breathing has been known to vary a great deal in severity from day to day, or even during the same day, definite inference must be made with caution.

Indications

At the present time it would seem that good results with this form of treatment were obtained in the long, severe, and continuous asth-

matic attacks, and asthma superimposed most probably on an asthmatic bronchitis due to an upper respiratory infection. Less remarkable results have been noted also in the lighter forms of asthma. It is possible that with increased knowledge obtained by trial and experiment very definite indication will be established for the type of asthma, the optimal dose, and the frequency of administration.

Administration

A word about the administration may prevent accidents and unfavorable results or reactions. A 50 per cent sterile solution of glucose was heated to 95 degrees Fahrenheit to avoid constitutional reaction. This solution was administered slowly by syringe through a medium sized needle. If the needle is too small there may be great difficulty in forcing the solution through the needle. If the needle is very large the solution may run into the arm too rapidly and produce a clot at the point of injection. Placing the arm in a horizontal position or even slightly lower than the forearm will also aid in preventing the coagulation of blood in the vein. Occasionally during the last part of the glucose administration the patient may complain of soreness in the arm. The pain follows the course of the vein and is undoubtedly due to an irritation of the venous wall by the concentrated glucose solution. It is possible that less concentrated solutions may give the beneficial pulmonary results and yet reduce the local danger of a thrombosis, or phlebitis.

Discussion

An intensive search of the medical literature revealed only one article published by Schafir[1] in 1927 under the title: "Treatment of Bronchial Asthma by Intravenous Injection of Grape Sugar." In the article reference was made to "Stein and Others," but their publications could not be found. He treated fourteen patients, ranging in age from 16 to 48 years. The duration of asthma was one to seven years. One patient, however, had asthma for two months only. Colds, fright, linseed oil, and wood pulp were stated as the causative agents. Intravenous administration of a 20 per cent glucose solution in 10 c.c. doses, was given for six to twenty days consecutively. Eleven patients had no reaction, while three showed a slight fever about ten hours after the injection. The results showed that during the treatment the attacks became less severe every day. In nine patients the attacks were gone for five months. In one case the attack recurred in less than a month, and was again relieved by the administration of glucose. When it recurred the third time, a 30 per cent solution was given, and the patient remained well for three months.

All of our patients attributed the asthma to an upper respiratory infection. The duration of asthma was from six months to nine years. Every focus of infection had been eliminated except in the third case, where septic tonsils were found and later removed. Two of the patients came under observation during a continuous siege of severe asthma over a period of several weeks. One had an acute attack superimposed on a chronic asthmatic bronchitis, and another had chronic asthmatic bronchitis only. In the first case, three intravenous injections of glucose eliminated the asthma, and when it recurred nearly five months later four injections again relieved the asthma. The second case was controlled by two injections and one month later the recurrence was also relieved by two injections. In the third case one injection was given during an acute attack, and in twenty-four hours the patient was free from asthma. The action on asthmatic bronchitis was less favorable. There was no constitutional reaction, but locally a few times a clot formed in the vein at the point of injection. The administration was then discontinued and the solution given in another vein.

The mechanism through which glucose acts is not clear. Some contend that the beneficial results follow an improved effect on the myocardium, while others consider glucose as an antidote for the toxic metabolites. The most common view, however, attributes the improvement of the patient to changes in the osmotic pressure in the tissues. Briefly, the concentrated glucose solution introduced into the vascular system withdraws fluids from the tissues and the surplus fluid is then eliminated by the kidneys. Whether or not similar results could be obtained by giving the patient large doses of ammonium salts by mouth or salyrgan by vein has not been demonstrated. Whatever may be the action, the glucose has a favorable effect on the intensity, as well as on the frequency, of the attacks.

The action of glucose is slow, requiring days, rather than minutes as in the case of adrenalin,

to show results. The effects, however, are more lasting and can be calculated in weeks or months rather than in hours or days. It is not a cure for bronchial asthma, but for its relief the treatment may be recommended. Indirectly it may also favorably influence the chronic bronchitis.

Summary

1. Four cases of bronchial asthma, secondary to an upper respiratory infection, were treated intravenously with a 50 per cent glucose solution.

2. Various amounts were tried, but the best results in the bedridden patients were obtained with 100 c.c. of glucose solution given consecutively for two or three days.

3. In the ambulatory type 50 c.c. of a 50 per cent glucose solution administered for several days gave encouraging results.

4. Concentrated glucose solution relieved the intensity as well as the frequency of the asthmatic attacks.

5. The attacks of asthma sometimes were relieved completely for several months.

Conclusions

1. It is possible that the intravenous administration of glucose solution may become a permanent adjunct in the routine treatment of severe bronchial asthma.

2. From the above study and reports in literature too little is known about this method of treatment to make any definite claims for it.

Reference

1. Schafir, M. M.: Treatment of bronchial asthma by intravenous injection of grape sugar. Vrach. Gaz., 31:1584-1589, 1927.

THE EYE IN CARDIOVASCULAR DISEASE*

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THERE has been, in the past thirty years, a definite increase in the incidence of cardiovascular disease. This is only partially accounted for by the gradually increasing length of life and the consequently larger percentage of the population attaining the age when certain forms of disease of the heart and blood-vessels are more common. Some forms of cardiovascular disease are obviously on the decrease. Improved methods of treatment of syphilis and more general recognition of the importance of the elimination of foci of infection have been responsible for the fact that luetic disease and the various clinical entities which were formerly grouped under the heading of "rheumatic" affections of the heart and blood-vessels are less frequently encountered than they were twenty or thirty years ago. This decrease has, however, been more than counterbalanced by the increase in the number of cases of the coronary sclerosis-hypertension group.

Naturally each organ reacts to the effects of abnormalities of the circulatory system in general and of its own blood-vessels in particular in a manner determined by its own particular structure and function. The effect of vascular disease on the eye is influenced by the delicacy and complexity of the eye tissues and by the fact that the circulation of the retina is largely effected by terminal vessels which do not anastomose, thus usually precluding the possibility of the development of a collateral circulation in the event of a partial or complete occlusion of a vessel.

The study of the eye changes in cardiovascular disease is of unique interest and importance both from a diagnostic and a prognostic standpoint. Here, with the ophthalmoscope, can be observed in the living patient, under magnification, the blood-vessels of the retina, affording an opportunity to detect the presence of vascular pathology and to observe its progress.

The pathologic states in the cardiovascular system which are, at times, reflected in the eye may be grouped under the following headings: (1) organic disease of the heart; (2) sclerosis or aneurysm of large vessels giving rise to pressure on adjacent nerves with consequent impairment of function; (3) hypertension; (4) sclerosis of the vessels of the choroid and retina; (5) embolism and thrombosis of the intrinsic blood-vessels of the eye; (6) diseases of the blood

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